Nutritional composition and characterization of sweet potato fermented with different strains.

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Outline

1. Introduction
2. Effect of different strains fermentation on nutritional functional components and flavor compounds of sweet potato slurry.
3. The sustainability of sweet potato residues from starch processing by-products: preparation with *Lacticaseibacillus rhamnosus* and *Pediococcus pentosaceus*, characterization, and application.
4. Conclusion

Abstract

Sweet potato (*Ipomoea batatas* Lam.) is widely used in primary processing, such as sweet potato starch, dried sweet potato, and sweet potato juice. During primary processing, a significant quantity of nutrients cannot be utilized and are wasted. Thus, it is necessary to develop an environmentally friendly processing technology to fully use sweet potatoes. For this reason, the nutritional composition and characterization of fermented sweet potatoes were studied. After being hydrolyzed by amylase, sweet potato slurry or sweet potato residues (SPR) were inoculated with 10% microorganisms, and then incubated at 37°C for 48 hours. Whether fermentation with *Aspergillus niger*, *Bacillus coagulans*, or the combination of *Lacticaseibacillus rhamnosus* and *Pediococcus pentosaceus*, all of them show the down-regulation in pH value. In contrast, the concentration of lactic acid and acetic acid indicate the opposite result. Simultaneously, although the concentration of sugar increases after the hydrolysis of starch, it decreases by the following fermentation. Similarly, dietary fiber was first increased due to hydrolysis, then decreased for utilization by microorganisms. Total polyphenol content also increases after fermentation, causing an elevation of antioxidant activities in fermented SPR. The volatile compounds rose dramatically after fermenting with *Aspergillus niger* and *Bacillus coagulans*. To further understand the digestibility and colonic fermentability of fermentation products, Zhu *et al*. conducted an *in vitro* saliva–gastrointestinal digestion and *in vitro* colonic fermentation. As a result, the acetate acid content increased from 820 to 1366 μg/mL, and the total polyphenol level increased from 138 to 178 mg GAE/100gDW during colonic fermentation time of 12 to 48h in the fermented SPR group. Additionally, the abundance of *bifidobacterium* decreased. In summary, fermented sweet potato is more nutritious than unfermented one, causing its health benefits, which may relate to gut microbiota.

References

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Zhu, L., Mu, T., Ma, M., Sun, H., & Zhao, G. (2022). Nutritional composition, antioxidant activity, volatile compounds, and stability properties of sweet potato residues fermented with selected lactic acid bacteria and *bifidobacteria*. *Food Chemistry, 374*, 131500.